Public-Private Partnerships in the construction of schools in Norway

by

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ABSTRACT

The purpose of this study is to investigate the use of the PPP model in the construction of schools in Norway. More specifically the main stakeholders' view and experience with the PPP model, and their perceived benefits or areas of improvement of the model. In addition the research investigates the type of innovations found in the each of the four stages of the project. The findings show that the project coalition and the decision power changes throughout the project, the flexibility that the end-user had over the facility prior to the PPP model is lower, but the flexibility is higher for the financial institution and the contractor. The findings also show that the end-user requirement is collected at an early stage of the project and their role and opinion is used throughout all the stages of the project, increasing the feeling of ownership for the end-user leading to a more positive attitude of the project outcome.

Keywords: PPP, Project Coalition, Innovation, School, Norway
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My family

Through-out the course of my degree, and the writing of my dissertation, my family have given me an incredible amount of support and at times, the determination to continue.

GLOSSARY OF TERMS

FM	Facility Management
PFI	Public-Private Initiative
PM	Project Manager
PPP	Public-Private Partnership
PSC	Public Sector Comparator
VFM	Value for money

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1 INTRODUCTION

1.1 Aims of the dissertation

The aims of this dissertation are to;

1. Explore the literature on the public-private partnership (PPP) model, the rationale behind PPP, innovation in construction sector and PPP as well as the project coalition.
2. Provide evidence of the structure and processes of the project process as well as the main stakeholders involved, and their perception and views of the PPP model used.
3. Examine how the PPP model brings innovation to the various stages of project.

Through-out the course of this dissertation attention is drawn on qualitative data collected from the key stakeholders involved in the first PPP school project in Norway and is analysed in relation to the published literature in the field.

1.2 Background to Research

PPP is a fairly new procurement method in Norway. Projects, which have used the PPP model, has either been half PPP projects where the contract does not contain the FM side or it has been road projects. The only full PPP projects in Norway have been road projects, and the first test projects started in 2001.

The development of PPP in the school sector started in 2002, when the local council decided to test out the PPP model by using it for building two schools in Oslo. The research focuses on the first of these two schools, which were finalised summer 2007.

1.3 Research objectives

- Identify and define the main stakeholders involved in the case study.
- Identify stakeholder roles and activities.
- Identity stakeholder's perceptions of the PPP procurement method.
- Identify whether the stakeholders expected outcome in terms of innovation; product innovation and the process innovation have been achieved in light of the procurement method used.
- Identify whether the stakeholders find the PPP procurement method to be an improvement to prior models for procuring schools in terms of innovation.
- Identify whether the stakeholders see any areas requiring improvement in terms of the procurement method used.
- Identify whether the benefits of PPP approach as perceived by the stakeholder's align with those identified in current literature.

1.4 Scope of the dissertation

The scope of this research is focused specifically on the PPP model and its benefits to the main stakeholder involved with PPP school projects in Norway. It is hoped that findings can be used to evaluate the future use of the PPP model, and deliver important insight from a project management perspective of the project process and the various stages the project goes through.

1.5 Structure of the dissertation

1. **Section 1: Introduction**

   This section provides an overview of the research concept, introducing the aim and scope of the dissertation, and the background behind the research.

2. **Section 2: Literature Review**

   This section discusses and reviews seminal and prominent research in the area of PPP. It also addresses the rationale of PPP, innovation and the types of innovation as well as project coalition.

3. **Section 3: Research Methodology**

   This section discusses the research methods used in the research and the researchers arguments as to why these methods were chosen.

4. **Section 4: Research Findings**

   This section is split into five main sections: The first section introduces the chapter and the case study, so for the reader to get an understanding of the location and the type of school. The second part of the first section explains whom the main stakeholders in the project area and what their role and activities are in the project. In addition an overview of the project timeline is given, explaining the main steps throughout the project. The next four sections focus each on one stage of the project; pre-tender, tender, construction or facility management. Each section analyses and explains the findings related to that specific stage in the project such as relationships, issues, innovation and change.

5. **Section 5: Conclusions**

   This section provides a summary of the key findings in the research and relates it to the literature reviews in section two. In addition this section also reflects on the value of the findings as well as giving recommendation for further research.

6. Section 6: Reference list

This section provides a comprehensive list of publications; journals, articles, web sites and books used in support of the dissertation, the list is in Harvard format.

2 LITERATURE REVIEW

2.1 Introduction

In accordance with the stated scope of this research this chapter explores public-private partnerships (PPPs) as they apply to the construction industry.

In the context of construction the benefits of PPPs has been argued to include lower project costs, shorter construction times and higher overall quality in the end product (Leiringer, 2003). The aim of the researcher is to provide an unbiased and critical description of the PPP model in order to create an understanding of the PPP model and the rationale behind it. In order to achieve this the chapter will discuss the definition of PPP, short about its history, the value for money rationale, risk rationale, and innovation rationale. The chapter will also discuss the project coalition of a construction projects.

2.2 What is a public-private partnership?

The UK government introduced the Private Financed Initiative (PFI) as a policy to allow and regulate privately financed public projects.' (Abdelhalim, 2007) It is evident from the literature that there is a lack of uniform agreement to the definition of PPP and PFI. Different countries, and even different academics have different definitions of PPP and PFI. The UK Treasury also defines PFI as a type of PPP, but looking at the difference between PPP and PFI is outside of the scope of this research, as well as the difference between the types of PPP definitions.

2.2.1 Definition of PPP

Focusing on PPP, it can broadly be defined as an arrangement between two or more entities, which brings the public and the private sector together, in a long-term partnership for mutual benefit (HM Treasury, 2000; Abdelahalim, 2007). However this definition opens up for interpretation, as the word partnership in this context is ambiguous and the outcome 'mutual benefit' is highly debatable. Currah (2000) and

Montanheiro (2000) both argues that the public and private sector cannot have mutual goals as their planning horizons differ. As a result one's long-term benefit might not be beneficial for the other party. On the other hand some argue that both sectors have their unique skills providing them with benefits in undertaking certain tasks and combining these skills might result in mutual benefit.

To narrow down the definition, PPP can be seen as an arrangement, in which the public sector contract services, with defined outputs, from the private sector including the construction and maintenance of the required facilities. A more precise definition needs to take into consideration the contractual form and the project finance type as well.

> *PPP is an arrangement between the public and private sector, where the private sector on a non-recourse or limited recourse financial basis provides a service under a concession for a defined period that would otherwise be provided by the public sector. (Leiringer, 2003)*

This definition needs some explanation. First 'non-recourse and limited recourse' refers to financing that is based on 'project finance', meaning that the financing is secured as a result of the future revenue generated by the project. Secondly, concessions means that the costs of the work being carried out by the private sector will be recovered by the end-user/public sector through the right to exploit the facility or the right to exploit in addition to payment. The third point evolves around the 'service... otherwise be provided by the public sector'. This limits the definition to not include traditional property developments and other projects, which do not include services provided by the public sector (Leiringer, 2003).

2.2.2 History of PPP

The idea that the private sector can fulfil a role in the funding, creation and operation of public sector services in by no means new. Traces of PPP can be found through out history as far back as the Roman Empire in 250 B.C (Polybius, 1979). However the main importance in the development of modern PPP launch of Private Finance Initiative (PFI) by UK's Conservative government, in their attempt update their old

privatisation and contracting out policies in 1979. The official aim was to improve the value for money, by improving the procurement of public sector projects by increasing private sector involvement and to benefit from their management skills. (Bousabaine, 2007). However this first initiative was received with caution and only a handful of projects had been started by the time the new labour government came to power in 1997 (Leiringer, 2003). New labour introduced a new approach introduced by the creation of the Treasury Task Force (TTF), which became the focal point of all PFI activities in the UK (Birnie, 1999; SO, 2000; Leiringer, 2003; Boussabine, 2007). Several European countries have followed the UK's initiative, by creating bodies similar to the TTF (Black, 2001). Norway however, did not create such a body, but their introduction of PPP is heavily based on UK's experience with the use of the model (OPS Portalen, 2008).

The Norwegian expression 'Offentlig Privat Samarbeid' (OPS)(PPP in the UK) was first used when the government started investigating the sociological impact an acceptance of privately financed road projects in Norway would have (OPS Portalen, 2008). In 2001, a decision was made to allow for three test road projects to be procured on the basis of the PPP model. However there is evidence of a handful of project prior to this, which today would have been categorised as PPP projects.

2.2.3 Definition of PPP in Norway:

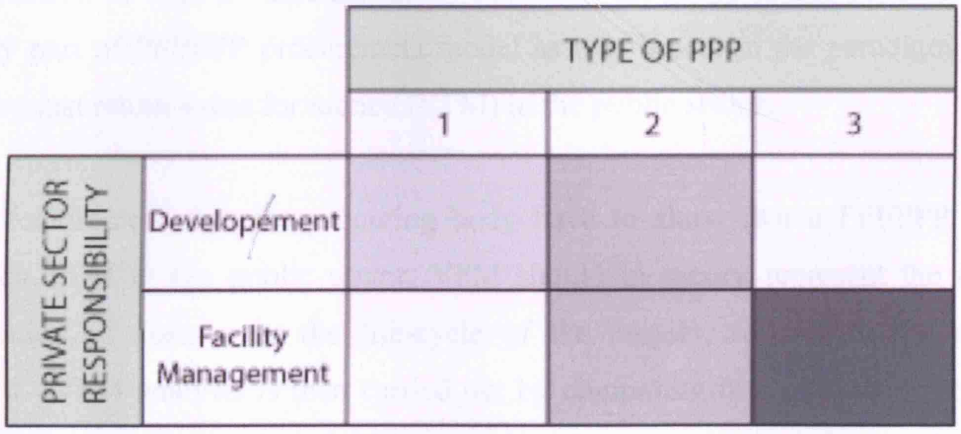

Figure 2.1 - Type of PPP
Source: Adapted from KPMG's PPP illustration for Norway (OPS Portalen, 2008)

KPMG defines PPP in Norway as a public service, which is developed and/or operated by the private sector (or with the public sector) where the risk is shared between the private and public sector. (OPS Portalen, 2008)

As Figure 2.1 - Type of PPP illustrates, KPMG has categorised 3 types of PPP models: Type 1 is very similar to the traditional building process, but where the risks is shared to a larger extent between the parties. This form of PPP is better known as "partnering".

Type 3 is very similar to the traditional way of procuring services. The main difference however, is that the contract relies more on outcome and quality measures of the service rather than the way it is conducted. But the public still withholds the power of controlling the quality and offer of the service. (OPS Portalen, 2008)

The most interesting model of PPP is type 2, where the public and private share the risk involved in the development and operational stage of the public service contract. OPS Portalen (2008), argues that the current PPP definition used in Norway needs to be refined to only embrace type 2 of the PPP model.

2.2.4 Value for money rationale

What is value for money? Is a topic on its own, and a complex one at that. Therefore the discussion of what is value for money is outside the scope of this paper. However it is key part of PFI/PPP procurement model as it is based on the paradigm that all projects must return value for money (VFM) to the public sector.

It is a requirement that the procuring body have to show that a PFI/PPP project generates VFM to the public sector. VFM should in theory represent the optimal combination of costs over the life-cycle of the project, relative to the benefits provided. VFM analysis is then carried out by comparing it to alternative solutions for acquiring the same project. VFM is based on the present value of these alternative solutions. HM Treasury guidelines require the public authority to make real choices between competing procurement routes. Where the option that demonstrates the lowest present value is normally selected, because it represents the lower cost to the public sector. EU Procurement rules also require public bodies to follow a strict

guide set in the process of choosing procurement route so to allow for fair competition between procuring bidders (RICS, 2007).

Grout (1997), criticises this approach. His research concludes that VFM is mainly biased against private sector finance. Later Broadbent and Laughlim (2003), points out that VFM has been the subject of much criticism in terms of whether it is possible to achieve sufficient savings to outweigh the basic fact that private borrowed capital is more expensive than government borrowings.

Others argue that 'real value lies not in the cost of the building work itself, nor the cost of running the building, but rather in putting the facility to work for its intended purpose – in short, value lies in the outcome' (The Smith Institute, 2005).

Boussabaine (2007) argues that the conflicting academic views on what is value for money demonstrates the need for a continuous assessment of VFM and development of key benchmark performance against realistic Public Sector Comparator's (PSC). He further argues that it is probably to soon to judge whether PFI/PPP projects have provided VFM to the taxpayers.

2.2.5 Risk transfer rationale

The PFI/PPP procurement model is intended to optimise the allocation of risk between the public and private sector. Risk in general should be held or transferred to the party best able to manage it (Winch, 2002). Further the public sector in known to be inherently risk averse, and PFI/PPP paradigm gives way for transferring the risk away from the public sector to more parties better suited to manage it.

Risk transfer on the other hand, brings up the complexity of how to assess and price risk. The measurement and pricing of risk are complex and problematic and yet play a significant part in the judgement between the PSC and the PFI/PPP alternatives selection.

Despite the complexity around risk assessment, NAO (2003) argues that PFI/PPP contracts provide greater time and cost certainty and hence show evidence of the successful transfer of risk to the private sector. Their research show that around 77 per

cent of projects procured by using PFI/PPP procurement model have been constructed on time and on budget. In contrast, only around 30 per cent of conventional procurement has.

However this success might also be seen as a result of other factors than risk transfer, as savings are asset related rather than savings in the provision of services. Edwards and Shaoul (2002) support this, they found that the concept of risk transfer that lies in at the heart of partnerships is problematic, regardless of whether the project is successful or not. If the project outcome is seen as successful the public body may still pay more than under a conventional procurement. On the other hand if a project is rendered unsuccessful, then the risks and costs are dispersed in unexpected ways. Hence, public accountability is obscured.

Though despite some academics concerns, others argue that the risk transfer works as an incentive for the private sector to concentrate on continuous improvement and maximising efficiency and thus deliver value for money to the public sector. (PricewaterhouseCoopers, 2002)

2.3 What is innovation?

Today, the term innovation is in many ways ambiguous and its wide applicability has resulted in a range of different definitions used in variety of contexts. As a result the word innovation can often mean different things to different people.

A common theme in definitions of innovation is to distinguish between innovation and change; in the sense that change for its own sake does not necessarily furnish benefits. (Lenard, 2001; Barrett et al., 2001) Hence, an innovation is to be seen as a positive change. Further innovation can be distinguished from invention, though an innovation could very well be an invention, an invention is not necessarily an innovation unless it has actually been used. Therefore an innovation that somehow is developed and put into use is an innovation.

The majority of the academic studies on innovation can be traced back to the work of Joseph Schumpeter dating as far back as 1911 and his work, Theory of the Economic Development (Smith, 1998). Smith (1998) describes the core of Schumpeter's definition of innovation as that is an effort made by one or several individuals that produces an economic gain, either by reducing costs or through increased income.

Schumpeter describes innovation as a "historic and irreversible change in the way of doing things. He further differentiated between five kinds of innovations: (1) introduction of a new product or a qualitative change in an existing product; (2) process innovation new to an industry; (3) the creation of a new market/segment; (4) development of new sources of supply for raw materials or other inputs; and (5) changes in industrial organisation. However the latter three was later more or less dismissed, as a result of the economic and social development making them impossible to do (Afuah and Bahram, 1995; Padmore et al. 1998; Smith 1998).

A review by Blayse et al (2004), identifies six main factors that influence innovation in construction; clients and manufacturers, the structure of production, relationships between individuals and firms within the industry and between the industry and external parties, procurement systems, regulations/standards, and the nature and quality of organisational resources. These influences are the key factors driving or hindering business innovation.

In terms of defining innovation Slaughter (1998) explains innovation as taking five forms depending on its characteristics. *Incremental;* small, and based on existing knowledge. *Radical;* a breakthrough in science or technology. *Modular;* a change in concept within a component only. *Architectural,* a change in links to other components or systems. *System,* Multiple, integrated innovations.

Merceau et al (1999) and Blayse et al (2004), argues that the construction industry encompasses a wide range of participants in a product system; governments, building material suppliers, general contractors, specialist contractors, the labour workforce, owners, professional associatations, private capital providers, end users of public infrastructure, vendors and distributors, testing services companies, educational institutions, certified bodies, and others.

Anderson and Mansueau (1999), defines innovation in the construction industry at a broader level. Where innovation is either *technical* or *organisational.* Technical innovation involves either the product or process innovation, whereas organisational innovation includes changes in organisational structure, management techniques and corporate strategy.

2.3.1 Project based innovations in construction

A tendency in studies of innovation has been to regard the organisation as a single entity. This conception of the organisation as a coherent entity is not always valid when it is applied to organisations involved in multiple projects. This is significant in the context of construction, where the core business is to undertake certain activities on projects, called project based organisations (Gann and Salter, 2000). Hobday (1998) describes these organisations, as often having project teams that have very limited contact with senior-management. Projects are also often based as the client's location and the project teams often work closely with several other organisations on-site.

2.3.2 Types of innovation

Product innovation is when a firm develops a brand new, or a major change to an existing product or service. (Page et al, 1999) The innovation should be based on the results of new technological developments, or by combining existing technologies in a new way (DTI, 2003 cited by Reichstein et al, 2005).

Process innovation is about the technological improvement in the process of creating a product. Improvements originated purely on organisational or managerial change should not be included. Process innovation can stem from changes in information and communication technologies (Page et al, 1999 and Reichstein et al, 2005).

Market innovation is related to the activity of a firm entering a new market, or creating a new niche market within an existing one. Market innovation can also stem from a firm developing new business opportunities (Page et al, 1999).

Organisational innovation is a result of an introduction of a new or significantly improved organisational structure, management system or work practice in the firm (Page et al, 1999).

Resource innovation stem from the acquisition, organisation and management of new resources. Resources can be people, knowledge and/or information (Page et al, 1999).

2.3.3 Success factors in construction innovation

Several studies have been undertaken in order to indentify innovation success factors in construction. Slaughter (1998) categorises four main aspects that is important when innovating in project-based situations. (1) The level of commitment to innovation, measured by the allocation of resources set for implementation. (2) The degree to which the innovation requires implicit or explicit coordination among 3rd parties. Implicit coordination includes activities such as the exchange of information, informal negotiations and collaborative problem solving. Explicit coordination is more of a formal type, through contracts and risk allocation. (3) The degree and type of potential additional resources required for implementing the innovation. Such as new technology or specially trained personnel. (4) The nature of supervisory activities. By this Slaughter (1998) means the level of supervision needed, production level or senior management.

2.3.4 Construction industry as a highly innovative industry

In some aspects the construction industry can be considered as highly innovative. As mentioned earlier problem solving is a strong source of innovation, but it is also a common part of most project situations. In construction the on-site nature of the production together with other characteristics such as the relative uniqueness of the project and the end products, in combination with new formations of projects teams, constantly generate new problems that have to be solved. The actors often need to apply resources to solve problems, generated by other project members, adapt to amendments to the plan or specifications by the client. (Atkin and Leiringer, 2000) However if this information and knowledge from problem solving in a project is not retained and the results used on future projects, it cannot be considered as true innovation.

2.4 The Project Coalition

Winch (2002) distinguishes between three types of project coalitions; separated, integrated and mediated project coalitions. Separated project coalitions is characterised by Winch (2002) as by the appointment or use of 'concours' for selecting suppliers for the design stage, and competitive tendering for the construction stages. Concurs is in essence competition based around the quality of the solution a supplier is proposing rather than its price. (Winch, 2002). In this form of project coalition the architect and any other designers are appointed, where the architect is leading the design team (Figure 2.3). The architect is then responsible for selecting the trade contractors that will conduct the work on-site. The architects are responsible for all overall co-ordination on the project, but are usually not liable for any failings on their part (Winch, 2002).

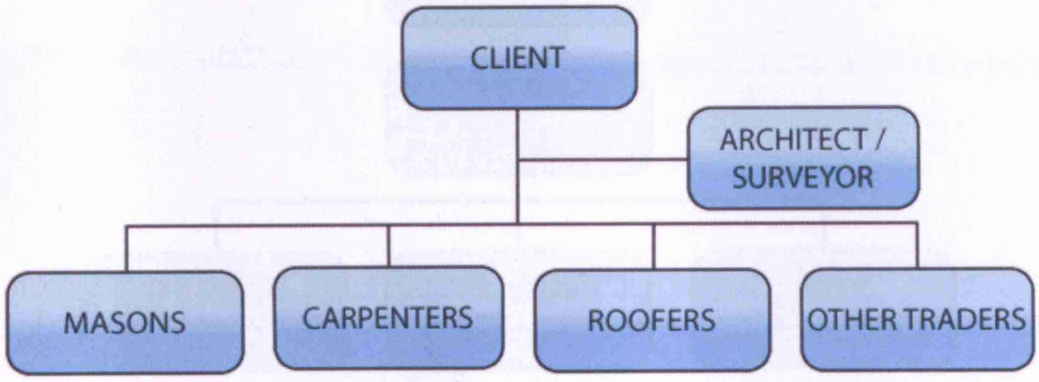

Figure 2.2 - Seperated project coalition: trades contracting
(Source: adapted from Winch, 2002)

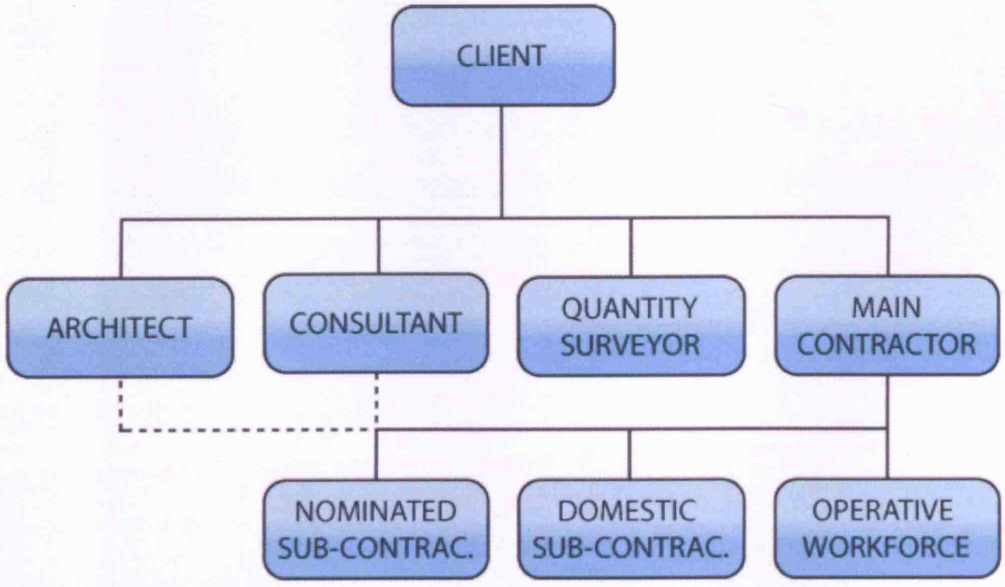

Figure 2.3 - Seperated project coalition: general contracting
(Source: adapted from Winch, 2002)

Integrated project coalition on the other hand is characterised by awarding the project by a single contract for both design and execution by the use of competitive tendering (Winch, 2002), also known as turnkey (Figure 2.4), design and build and single-point of responsibility. Clients that want to transfer most of the risk to the supplier favour this project coalition. The public sector is such a client, as they are by nature risk averse. The client will have to select the supplier at an earlier stage in the project life cycle when using integrated coalitions. Therefore this coalition type is not suitable for projects with high uncertainty, and tends to be used on project types that include buildings with some degree of repetitiveness such as industrial and commercial facilities (Winch, 2002).

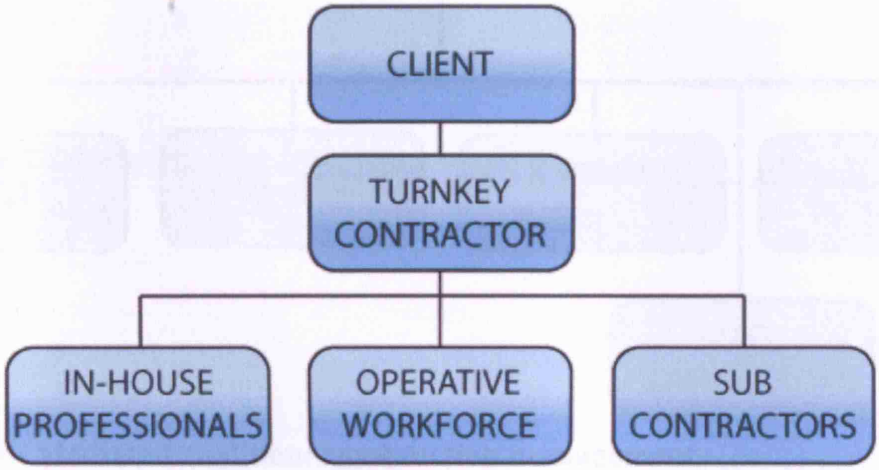

Figure 2.4 - Integrated coalition: turnkey
(Source: adapted from Winch, 2002)

Mediated coalitions are becoming more usual, especially for project containing high mission uncertainty due to technical challenges or the importance of a quick delivery (Figure 2.5). Winch (2002) explains the structure of the mediated coalition as characterised by the appointment of not only the designers but also construction managers which will be responsible for managing the trade contractors mobilised for execution on site. The construction managers will then normally select the trade contractors based on competitive tendering (Winch, 2002).

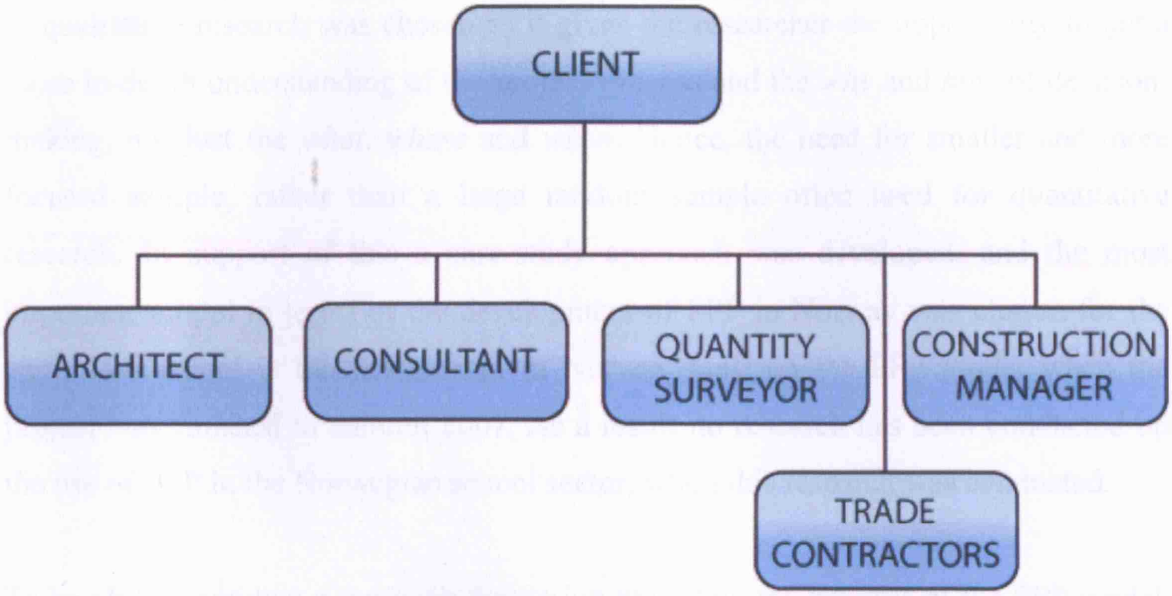

Figure 2.5 - Mediated coalition: construction management
(Source: adapted from Winch, 2002)

2.5 Most common arguments for the public sector to use the PPP model

The most common arguments for the public sector to use PPP models are: (1) The public sector will be able to accept new and more investments than what would have been possible if it was to be financed internally, and without increasing public debt. (2) To reduce public spending, (3) lack of technical knowledge in the public sector, (4) support risk aversion in public sector, (5) the private sector holds better incentives and innovativeness, which is expected to result in higher efficiency and lower life cost of projects built on the PPP model, (6) increased income for the public sector. (Grout, 1997; Grout, 2003; Owen and Marna, 1997; Ribault, 2001; Parker and Hartley, 2003; Mayston, 1999; Econ, 1999; Grimsey and Lewis, 2004, Grimsey and Lewis, 2005)

3 RESEARCH METHODOLOGY

3.1 Introduction

This section discusses the research methods used in the research and the researcher's arguments as to why these methods were chosen.

A qualitative research was chosen as it gives the researcher the opportunity to get a more in-depth understanding of the project process and the *why* and *how* of decision-making, not just the *what*, *where* and *when*. Hence, the need for smaller and more focused sample, rather than a large random sample often used for quantitative research. In support of this a case-study approach was developed, and the most important school in terms of the development of PPP in Norway was chosen for the case. The school is the first school in Norway built on the PPP model when the project was finished in autumn 2007. As a result no research has been conducted on the use of PPP in the Norwegian school sector, when this research was conducted.

To be able to conduct a thorough discussion regarding the benefits of the PPP model, an in-depth knowledge of the project process is important. To develop such knowledge a project management perspective was used.

3.2 Case study

One of the most frequent criticisms of the case study approach is that its dependence on a single case renders the conclusions unable to be generalised. Yin (1993) however, argues that the goal of a study is to establish the constraint, which then should be applied to all research. This way Yin (1993) argues that even a single case could be considered acceptable, provided it met the established objectives. Yin (1993) also argues that the case study satisfies the three tenets of qualitative methods; describing, understanding and explaining. As there are only one school project in Norway built on the PPP model, the choice were limited to the one used in this research. Persbråten was chosen as the main case study as it was seen as the most

important project of the two, and the only one completed at the time of the study. Some reference is given to the second school, as the stakeholders are the same for both schools.

Stake (1995) and Yin (1994) identifies at least six sources of evidence in case studies; documents, archival records, interviews, direct observation, participant-observation and physical artefacts. Stake (1995) and Yin (1994) both argue that Interviews are one of the best sources of case study information. Interviews were therefore chosen as the main source of information as it is seen as the most applicable information source.

3.3 Interviews

Five interviews were carried out with each of the main project stakeholder. By interviewing the main stakeholders, the researcher can get a biased view of the project process and a good understanding each stakeholders experience and view of the PPP model. Collecting the data from multiple sources also ensure that the research is supported by triangulation. Triangulation is important in terms of the ethical need to confirm the validity of the data, and as Yin (2003) argues, in case studies this can be achieved by collecting the data from multiple sources.

To collect the information needed to answer the research objectives it was decided to use semi-structured interviews, with open-ended questions to identify the views of each individual stakeholder. The benefit of using such an interview style is that is would enable the researcher to let the interviews talk openly about what they find relevant. As a result, information might be gathered about the process, which would not have been discovered if structured interviews with closed-ended questions were used. For more in depth information about certain areas of interest uncovered in the initial interviews, follow-up questions based on a more closed-ended style will be conducted.

3.4 Interviewees

The five interviewees were chosen, based on their importance in the project process and their active role in the project. A short introduction of each interviewee follows:

Interview 1:

Emil Hassle, Dean of school at Persbråten. Emil Hassle has been the Dean of the school for several years. In addition to having extensive experience from running the school, he also has experience from an earlier school project procured on the traditional model. Giving him great perspective on the difference between the models in both the construction process as well as operating the school under both contract types.

Interview 2:

Petter Hasselroth, Project Manager for Skanska Bygg. Petter Hasselroth was in charge of the construction stage of the project for Skanska Bygg, he has no experience from building schools but extensive experience from other construction project. In addition he also has experience with PPP from some of Skanska's road projects.

Interview 3:

Sverre Magne Solem, Department Manager and Project Manager for SG Finans. Working with in a team of four at SG Finans, we were leading SG Finans involvement in the project.

Interview 4:

Trygve Strand, Project Manager for Coor Facility Management. Being the project manager for Coor, he was the main person representing Coor in the school project.

Interview 5:

Tore Jakobsen, Project Manager for Undervisningsbygg. Tore Jakobsen has extensive experience from building and refurbishing schools in the Oslo region.

3.5 Interview design process

The interview design process started off by setting out some themes that interview questions could be designed around.

Themes:

1. The company's role in the project
2. The company activities in this project
3. The interviewee's role in the project
4. The interviewee's perception of the PPP method used.
5. The interviewee's expected outcome in terms of innovation as a result of the PPP model.
6. The Interviewee's opinion of the procurement method used in relation to more traditional methods.
7. The Interviewee's opinion on areas of improvement for the PPP model used.
8. The Interviewee's perceived benefits of the procurement method.
9. How does the Interviewee see the future use of PPP for building schools in Norway.

Based on these themes, specific questions were created under each theme, designed to get the interviewee to talk as much about the related theme as possible. By trying to predict the answers of the interviewee, following-up questions were also created to direct the interviewee into the areas of interest.

Having a set of open and closed ended questions under each theme in a semi-structured manner, gave the question set a diverse use. Therefore it could be used on all stakeholders, as questions specific to certain areas of the project stages and stakeholders could be used or left depending on the interviewee.

3.6 Interview evidence style

To collect the evidence of the interviews, recordings were made so that transcripts could be created. The transcripts were then used as the bases for the analysis. The first part of the evidence collection process started with mapping the various themes found

in the transcripts. Following this a comparison between the identified themes found in each of the interview transcripts were conducted to summarise the main themes throughout the interviews.

The themes found was somewhat expected, but it also brought up a few new themes. Such as how the project coalition changed its composition throughout the project and transfer of flexibility from the client to the finance institution and the contractor.

3.7 Conclusion

To conclude whether the correct research methodology is used, you have to see it in the light of the findings. The findings reveal extensive in-depth information regarding several aspects of the project process, and answers all the research objectives. In addition the research found several interesting themes such as the project coalition, which was not anticipated when setting the research objectives. All this support that the correct research methods was used.

Looking at the value of the evidence collected, the researcher believe that the knowledge gained by this research will be of great value of project manager or stakeholders that will take part in a similar school project. Further specific evidence found such as the changes to the project coalition throughout the project process might be interesting to see in relation to similar projects in the UK.

4 FINDINGS

4.1 Introduction

The findings presented in this chapter are a result of five interviews with the key stakeholders in the project.

Persbråten (Figure 4.1, Figure 4.2 and Figure 4.3) is an a-level school, for kids in the age group sixteen to eighteen. The school is located on the west side of Oslo, in one of the better suburbs in Oslo. The original school building was built in 1959, and was built as a temporary solution, which over the years became permanent. The state of the old school was terrible and it was in dire need of renewal (Figure 4.2) (Persbråten, 2008 and interview 1).

Figure 4.1 - Persbråten vgs - Bird's eye view
(Source: Multimap, 2008)

Figure 4.2 - Persbråten vgs - The old school building
(Source: Persbråten, 2008)

Figure 4.3 - Persbråten vgs - The new school building
(Source: Persbråten, 2008)

4.1.1 Project overview

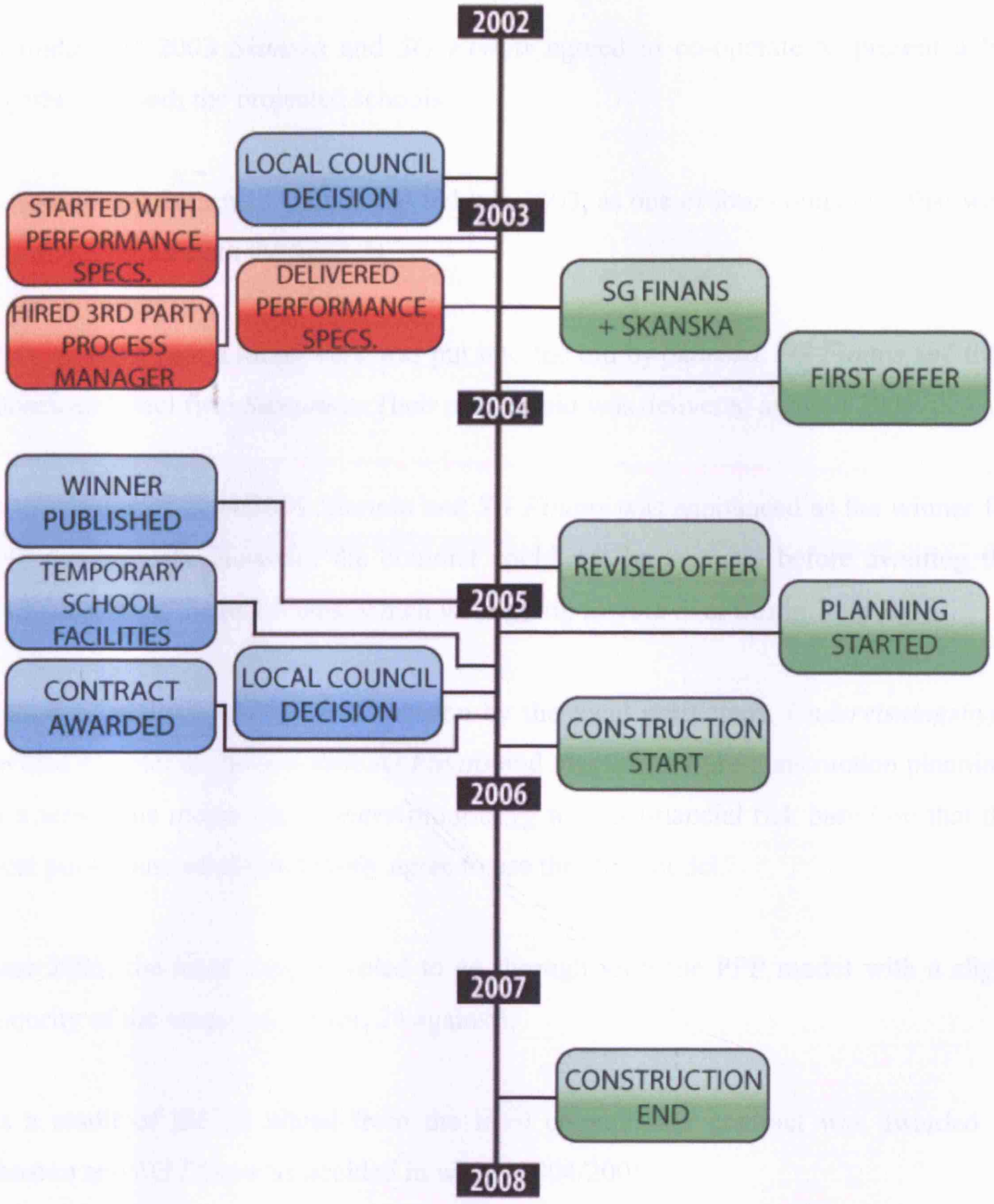

Figure 4.4 - Timeline Persbråten project
(Source: Simonsen, 2008)

In late 2002, the local council decided to build two schools on the new PPP model. As they wanted to test this model, they chose two different schools. The first school that was chosen was Persbråten vgs a college level school that needed to be rebuilt. The second project a primary school, situated on the other side of the capital, needed one

building totally rebuilt and second building built. As part of the decision to go forward with the PPP model, a clause was created, given the politicians the possibility to pull out late in the process (June, 2005).

In middle of 2003 *Skanska* and *SG Finans* agreed to co-operate to present a bid together for both the projected schools.

Together they presented their initial bid late 2003, as one of four companies that were pre-qualified for both the projects.

Over the next year a lot of work was put into the bid by *Skanska, SG Finans* and their chosen architect firm *Signature*. Their revised bid was delivered autumn 2004.

In the winter of 2004/2005 *Skanska* and *SG Finans* was announced as the winner for both the projects. However the contract could not be awarded before awaiting the confirmation of the politicians, which were going to vote over this in June 2005.

Instead of waiting for the final decision by the local politicians, *Undervisningsbygg* decided to enter a contract with *SG Finans* and *Skanska* for pre-construction planning. In a sense this meant that *Undervisningsbygg* took a financial risk based on that the local politicians would ultimately agree to use the PPP model.

June 2005, the local council voted to go through with the PPP model with a slight majority of the votes for (26 for, 24 against).

As a result of the go ahead from the local council, the contract was awarded to *Skanska* and *SG Finans* as decided in winter 2004/2005.

Skanska started the construction in early autumn in 2005, when the school moved to temporary facilities off-site.

Project was finalised in May 2007, and the school administration moved back into the new facilities.

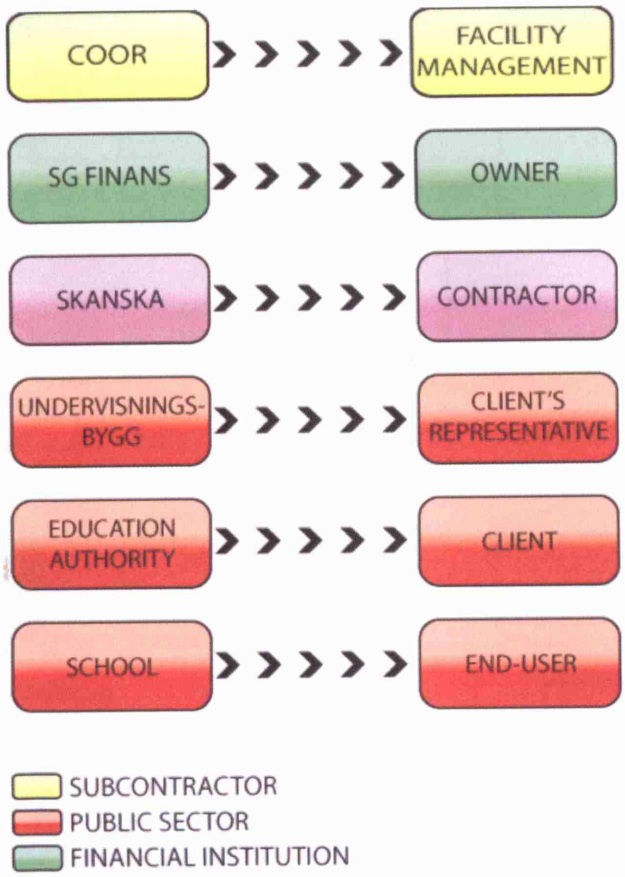

Figure 4.5 - Main stakeholders
(Source: Simonsen, 2008)

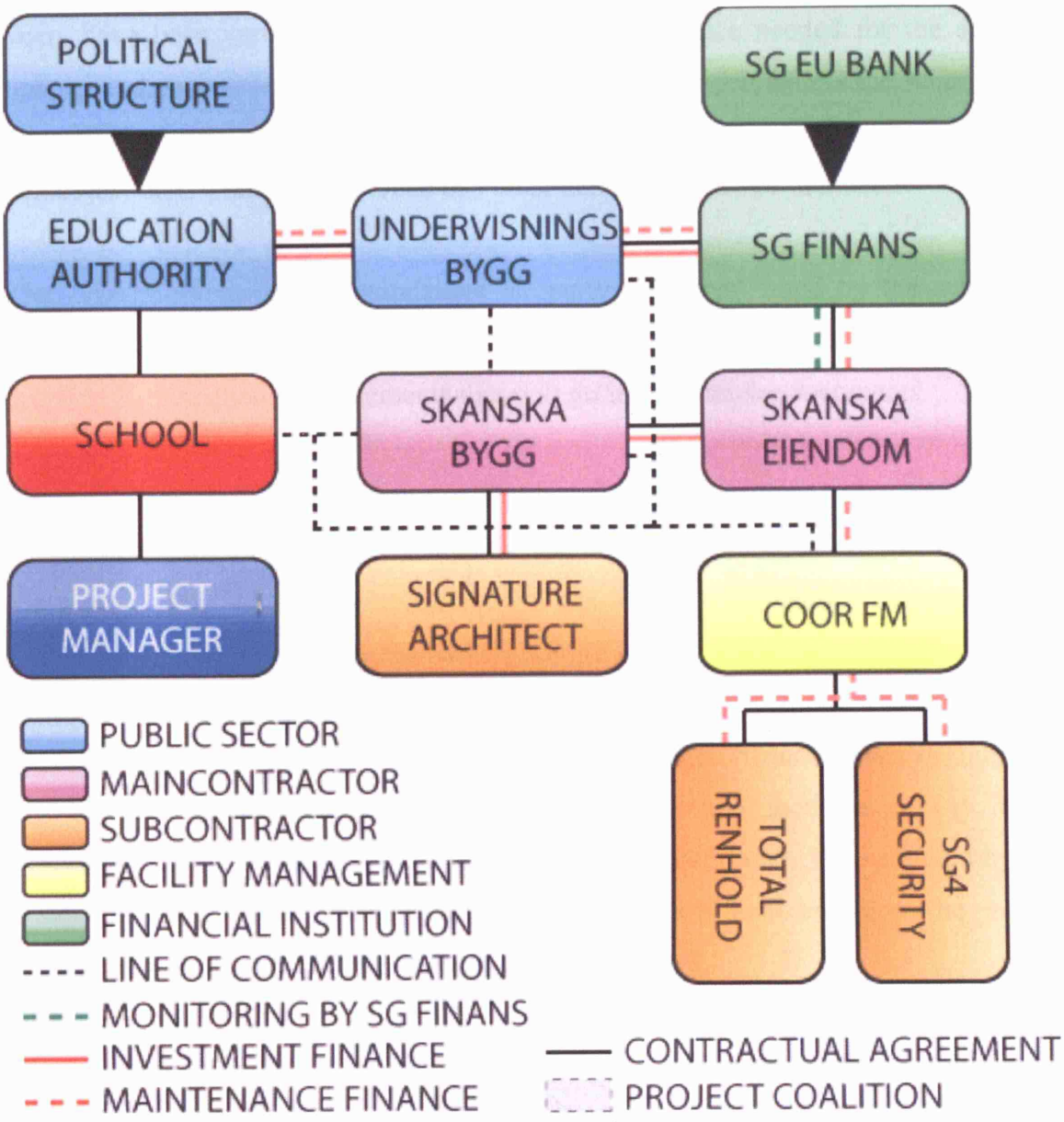

Figure 4.6 - Project relationships
(Source: Simonsen, 2008)

4.1.2 The parties involved and relationships

The *political structure* means the local council, which is in charge of all major decisions in Oslo's school sector. To use the PPP model for these two school projects was a decision made by the local council by votes and is heavily affected by the political landscape in Norway.

The *school* is the end-user, where the Dean of the school is the highest authority. Their yearly budget that they receive from the Education authority should cover both salaries as well as cost involved with school maintenance. The problems over the

years have been insufficient budgets to cover the finance needed for the school's upkeep and payroll (Interview 1, 2, 3, 4 and 5). Another problem is the schools own allocation of money where upkeep often is sacrificed to keep more money for staff (Interview 2, 3, 4 and 5). The Dean of Persbråten is interviewee number 1.

The *Project Manager* is a standalone 3rd party consultant hired by the school by funding provided by the *Education authority* to guide the school in creating their proposal for the clients requirements that will go into the tender documents.

The *Education authority* is the owner of all schools in Norway, and also the employer of schools' staff. Though the *school* is the end-user, the client is the *Education Authority*. The *Education Authority* has a back-to-back contract with *Undervisningsbygg* to procure the two school projects.

Undervisningsbygg was prior to 2002, a part of the *Education Authority* but was separated as their own entity to be in charge of the school facilities in Oslo. Their customer are only the *Education authority* or the *schools* direct. They are paid by the *Education Authority* for their services through a back-to-back contract. The project manager for *Undervisningsbygg* is interviewee number 5.

SG Finans is one of the leading companies within equipment leasing and factoring and are part of the international bank, Société Générale Group. In recent years they have moved into leaseback agreements with councils for care homes and schools. *SG Finans* as the sole investor of the two projects, have a contract with *Undervisningsbygg* to buy the two schools, build the new buildings and deliver 25 years of FM services to the standard specified in the contract. *SG Finans* chose to use *Skanska Eiendom* as their main contractor and facility management firm. The project manager for *SG Finans* is interviewee number 3.

Skanska Eiendom is the part of *Skanska*, which makes the decision on whether to bid for a project. When entering into a partnering agreement with *SG Finans*, and the bidding stage of the two school projects the plan was to use *Skanska Bygg* for constructing the school and Skanska Facility Management for the FM services. However in the middle of the bidding process Skanska FM was sold to *Coor*, this sell-

out resulted in a transformation period for the new company and the result was that Coor struggled to commit fully to the project.

Skanska Bygg is fully owned by *Skanska* Norway and is a pure construction entity in charge of constructing the schools for *Skanska*. The project manager for *Skanska Bygg* is interviewee number 2.

Coor is in charge of the FM services at both schools, though most of the FM activities are done in-house, they have some major subcontractor mainly for cleaning and security. (Interview 1 and 5) The project manager for Coor is interviewee number 4.

Signature Architect is the architect used by Skanska to design the facility at Persbråten and Høybråten.

Total Renhold and *SG4 Security* are subcontractors of *Coor* and are in charge of cleaning services and the security system respectively.

4.1.3 Benefits of the PPP model

Increased cost predictability

Increased cost predictability is seen as an advantage by all the interviewed parts. The *Education Authority*, have now one price to consider for the whole project including operational and facility management cost for the contract period. While before it faced the risk that a design created in advanced of a bidding contest, would not meet their cost prediction. In case of bids coming in at a higher price levels than expected, alterations of the design or abandonment of the project might be necessary leading a large cost wasted in the project stage (Interview 1).

Skanska on the other hand find it easier to predict costs as well as they are now more in charge of decisions, which increases their own efficiency. Being part of the design phase also let them design the facility in a way that makes the construction stage efficient. (Interview 2). *SG Finans* see the increased cost predictability as positive, as it lowers the risk of the project. As a result the project becomes more viable for them to take part in, and the cost of capital is cheaper which benefits the client (Interview 3). The overall result of the increased cost predictability is a lower construction and

life-cycle cost for the client, who is further supported by *Undervisningsbygg*, "It couldn't have been built cheaper, than by using the PPP model" (Interview 6).

The nature of the political system is the reason why PPP is needed

One advantages of the PPP that has come through in all interviews (Interview 1, 2, 3, 4 and 5), is based on a disadvantage of the political system. There is a common belief that the way the political system and politicians allocate money is the reason for need of the PPP model. Local politicians as well as national level politicians are voted in for a period of four years. As a result they allocate money to project that will promote their political party and themselves rather than what is best in the long-term for their voters. This is evident in the way politicians prefer to spend money on new projects that gives PR rather than spending money on the upkeep of existing public facilities. The school standard therefore drop as a result of to little allocated to maintenance and a total rebuild or expensive refurbishment is therefore needed resulting in higher life-cycle cost of the facilities. The PPP model on the other hand will ensure that the school hold the same standard throughout the 25-year contract.

4.2 Stage 1: Pre-tender

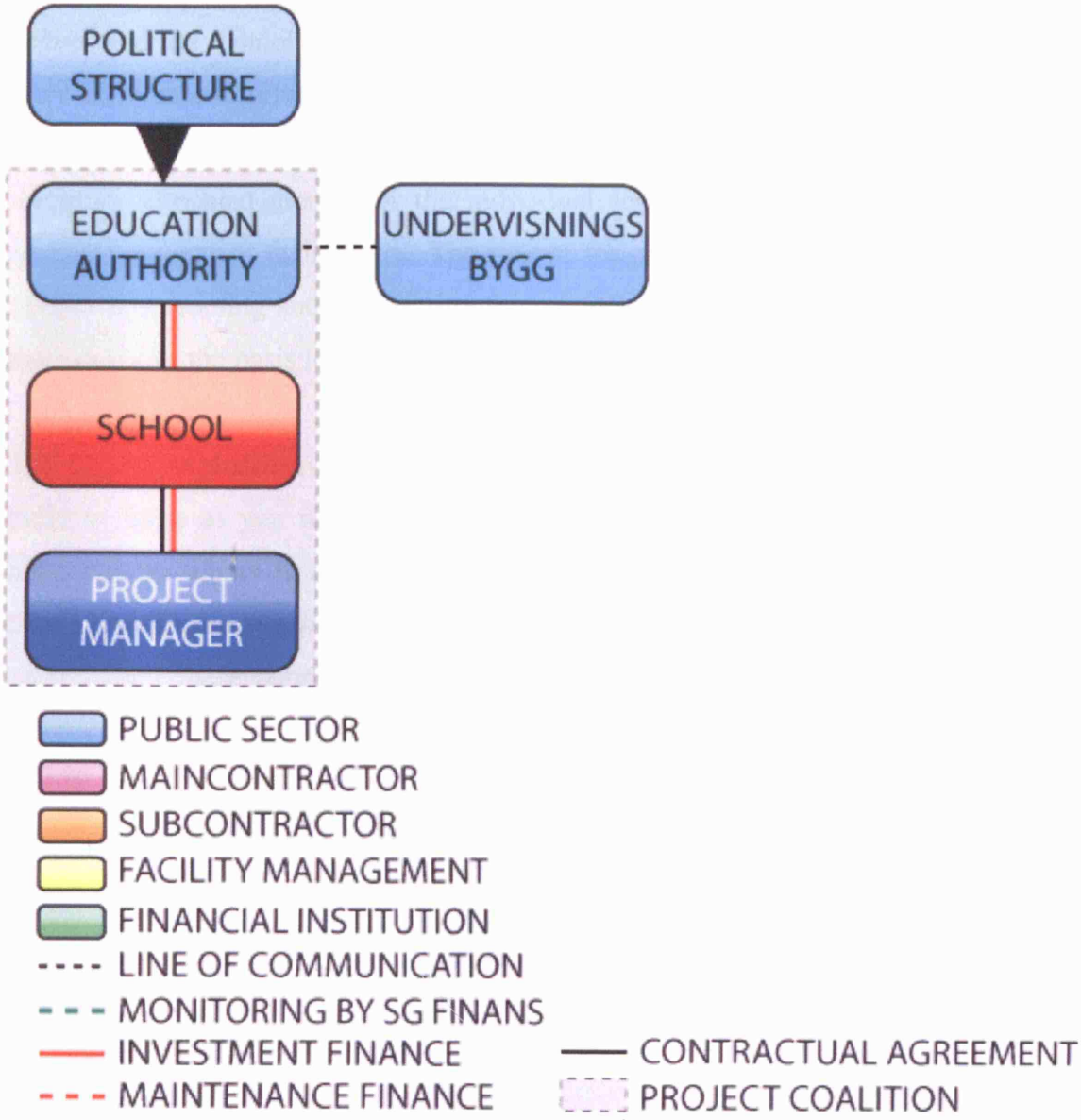

Figure 4.7 - Stage 1: Pre-tender
(Source: Simonsen, 2008)

4.2.1 Diagram

This stage of the process as seen in Figure 4.7 is very end-user and client orientated. What is interesting with this stage is that the client has received investment finance by the client to employ a 3rd party project manager. Under traditional methods the school would not have benefitted from a professional PM to guide them through a complex process such as formulating the schools objective into a client's brief.

4.2.2 Overview

The Pre-tender stage is the stage in the project where only the *Education Authority*, *School* and the School's 3rd party *Project Manager* is involved. This stage started in early 2003 as a result of the *Local Council's* decision that the schools was to be built or refurbished based on the PPP model. Acting on this decision, the *Education Authority* allocated money for the individual schools for them to hire an external *project manager* of their choice. The role of the *project manager* was to support the *school* in promoting and formulating the school's needs and wishes into a document that would be the basis for the client's brief (Interviews 1 and 2).

The *Education Authority* provided the school with some unclear restriction "you can't build as large as you want, 60m^2 classrooms is way to much" (Interview 1) when planning the school in terms of room functions and room sizes needed. The initial plan given to the *Persbråten* was a school for about 700 pupils. Based on this the school used these restrictions and guidelines to plan the school's room functions (Interview 1).

The Dean of *Persbråten* involved the whole administration and the teachers to collect all opinions and suggestions of the people involved. By splitting the teachers and staff into project groups based on each academic course available at the school, the Dean and the others involved at the top level of the school's administration could collect the data easily (Interview 1).

The *School* also found it very successful to have a third party *project manager*, with experience from similar projects. The *project manager* worked on behalf of the school to guide them through the process of creating their proposal for the client's brief. (Interview 1).

The *School's* time for preparing their proposal was cut short by the *Education Authority* to speed up the process, giving no room for a give-and-take phase. The school also received more specific floor size restrictions by the local council, cutting their proposed floor plan by as much as 50%. Evidently leading to a different plan

overall, leaving the school out of control of the final outcome. Leaving the *school* with a sense of lost ownership over the project outcome (Interview 1).

4.2.3 Innovation:

The process is somewhat different in the pre-tender stage. The *school* benefitted from a *project manager* paid by the *Education Authority,* something that schools normally do not have in such situations. Being able to use a project manager that would work for the school rather than the *Education Authority* resulted in a higher chance for getting the end-users objectives into the final contract (Interview 1 and 6).

Receiving extra funding to have all the teachers at the school involved in the creation of the *school's* proposal for the clients requirements led to an increased feeling of involvement by the staff. It also made the school more psychological prepared for moving into a transitional period, in temporary facilities before moving into the new facilities (Interview 1).

The funding provided by the *Education Authority* to the school for them to have their own PM and time to work on their proposal made a great basis for involving the school and to collect the end-users requirements in the final product. However poor communication, lack of restrictions and guidelines by the *Education Authority,* left the *school's* work to some degree obsolete (Interview 1 and 3).

4.3 Stage 2: Tender

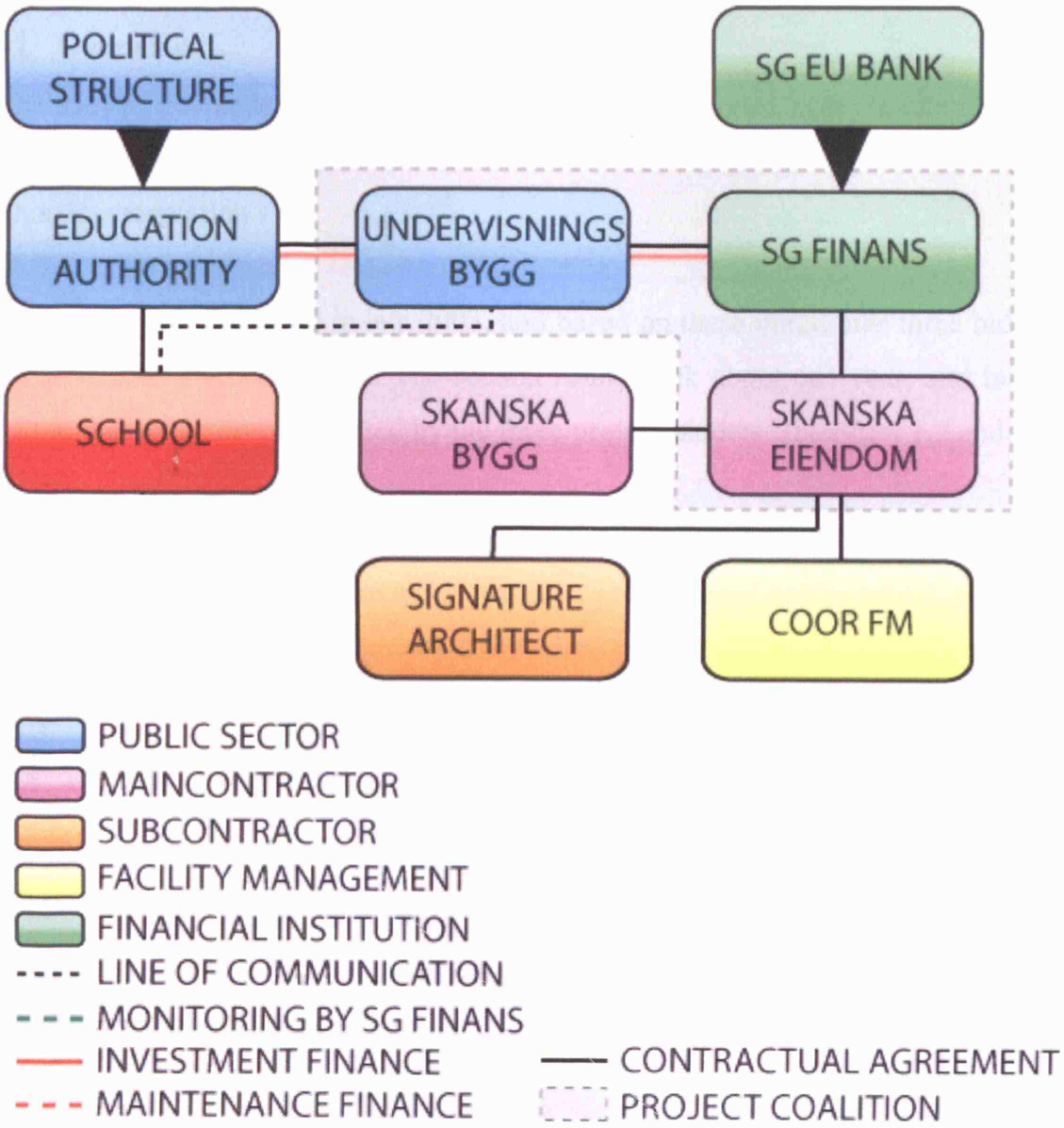

Figure 4.8 - Stage 2: Tender
(Source: Simonsen, 2008)

4.3.1 Diagram

The project coalition has changed since the pre-tender stage, to include only *Undervisningsbygg, SG Finans and Skanska Eiendom* (Figure 4.8). The most noteworthy part of the diagram is the communication line between the *school* and *Undervisningsbygg,* which illustrates that the school was allowed to take part in the bidders selection process. For the school to be able to take part in the selection

process in not normal procedure in construction of new schools in Norway, and is new under this project. The schools involvement withholds some of the project's focus on the end-user, rather than being pre-dominantly finance focused by SG Finans and Skanska Eiendom being part of the project coalition.

4.3.2 Overview

At the start of the tender stage the *Education Authority* handed over the client's brief to *Undervisningsbygg,* which went out to tender with five prequalified bidders based on this documentation.

The first bids were received in late 2003, and based on these initial bids three bidders were invited to a second round. The second round took about one year, and in late 2004 the revised bid was delivered by the three project bidders (Interview 1,2 and 3).

The Dean of the Schools was invited to take part in the selection process by *Undervisningsbygg's PM.* An invitation that was not expected by the school, however they saw the invitation as a gesture by *Undervisningsbygg* to amend the abrupt ending of stage 1 and the give-and-take process. Being able to take part in the final selection process restored some of the feeling of ownership lost in the first stage (Interview 1 and 3).

SG Finans and *Skanska Eiendom* were chosen as the winner for both the projects.
The decision committee chose *SG Finans* as their solution was the best in terms of design and function. However they were also far lower on price that the competition (Interview 1, 2 and 3).

Part of the contractual agreement between *Undervisningsbygg* and *SG Finans* was that *SG Finans* would buy and finance the construction and FM services for the next 25-years. In return *SG Finans* would receive an annual set payment from *Undervisningsbygg,* which will attain rent from the *Education Authority* (Interview 2, 3 and 5).

4.3.3 Innovation:

New procurement method

The two schools in this project are the two first schools, which are entirely procured, based on a PPP model in Norway. And *Skanska* has never taken part in building a school based on a PPP model before, however they do have some experience with PPP from some road projects in Norway (Interview 2). *SG Finans* on the other hand have some experience with a school project, which started off as a PPP project, however the client decided to go with a traditional procurement instead. In addition *SG Finans* have some experience from the role as financing care homes, however these projects were already built when they entered into a 25-year leaseback agreement (Interview 3).

Increased flexibility in design phase

One of the major benefits as seen by *SG Finans* and *Skanska* is the increased flexibility the PPP model have given them in design and engineering decisions. Giving the contractor the ability to design the building based on a list of room functions and requirements from the client rather than a fixed design as in traditional contracting. Leads to an increased flexibility for *Skanska* to work with people and firms they trust, as well as choosing solutions and materials that they feel comfortable with and which they from experience know will increase the quality to cost ratio (Interview 1). It also gave *Skanska* the ability to quickly make any design changes throughout the construction process without having to consolidate with the client first. The final outcome was that *Skanska* was able to build the school cheaper and more efficient than a under a traditional contract, which is evident by the project being on time and on budget, both the client's and *Skanska's* own internal budget (Interview 2 and 5)

Innovation in solutions

The PPP model has increased *Skanska's* focus on lowering the life-cycle cost of the building. *Skanska* initiated the idea of using ground heat to lower the electrical cost of the school, but not as much for larger facilities such as schools even though the Government has agreed to work towards more renewable energy sources for public facilities (Muller, 2006). By digging down a water tank deep underground, the soil

heat will act as a water boiler. By pumping this water back up to the building, it is used for heating and as hot water for the facility. Even though *Skanska* admits this function hasn't worked as well has initially expected it is a sign of PPP being an incentive for innovations.

Innovation in materials

The PPP model has further increased *Skanska's* focus on materials, which would withstand long-term use, such as stone. Stone has been used extensively throughout the facility, especially in high wear and tear areas (Interview 1 and 2). In addition stronger hand railings and wall protections are used to handle the wear and tear expected from pupils (Interview 1).

Innovation in design

Skanska's focus on lowering the operating costs of the school is evident already at the design stage. *Skanska* designing the main building with large glass façades, that would harvest natural light and heat from the sun to warm up and light the indoor area. To control heating *Skanska* implemented maintenance-free quality automatic blinds, and high-end glass to stop heat from escaping. All evidence of how the focus has been increased on solutions that is believed to deliver lower life-cycle costs of the building (Interview 1 and 2).

Innovation in design part 2

Another factor that was given a lot of consideration in the design phase was incorporating solutions to keeping dirt from being dragged from the outdoor areas into the school building. This was *Coor's* main field of interest throughout the design phase. The solution was to use a "three zone entrance", which means to have two sets of doors about 2-4 meters apart at the entrance. The 2-3 meters between each door, serviced as a collection area to stop water and dirt to be dragged further into the building (Interview 2). The result of this solution has lowered the resources needed to clean the facilities, especially on rainy days when dirt is more easily dragged in.

Innovations in contracting

The contracting under this PPP project has been design differently than past solutions to create a two-stage contract agreement. Past PPP contracts have involved all parties in the project in the contract for the whole duration of the project construction as well as the facility management part. The new set-up splits the contractual agreement in two stages, construction and facility management. The result is a clever and simpler contract to use, as companies taking part in the construction stage is signoff at completion. Leaving only companies involved in the facility management stage part of the contract after the construction stage is completed. In case of a conflict, the contract will include only parties involved in the stage of the project, which is applicable. The final outcome of this type of contract is that it is easier to manage legally, leading to quicker solutions lower costs for the parties involved. (Interview 2 and 3).

4.4 Stage 3: Construction

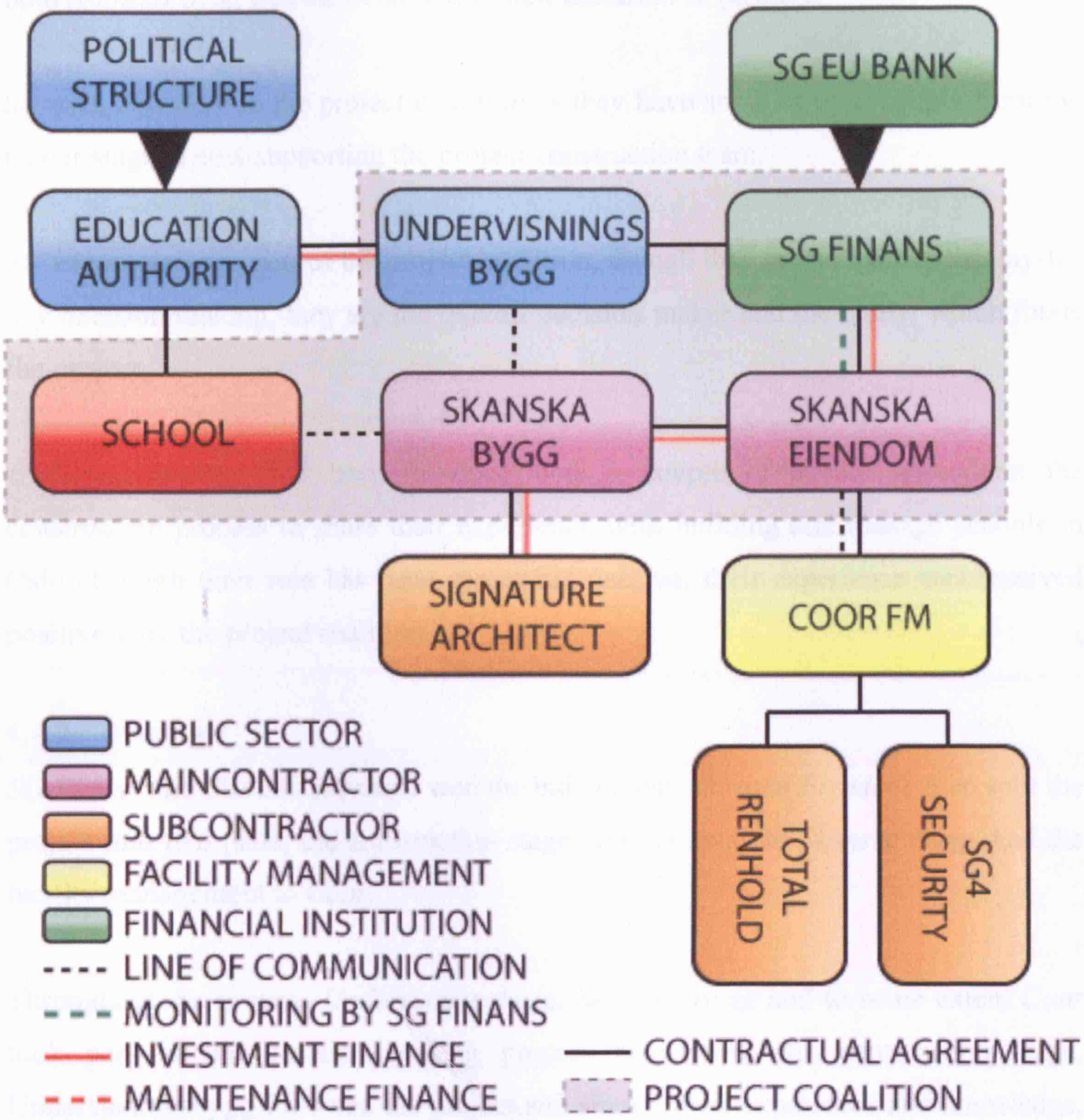

Figure 4.9 - Stage 3: Construction
(Source: Simonsen, 2008)

4.4.1 The diagram

Figure 4.9 illustrates the relationships between all the major parties involved in the construction stage. The first point noteworthy is that the project coalition has changed since the tender stage. *Skanska Bygg* now being the centre of coalition is understandable as they are the ones undertaking the construction. More important though is the inclusion of the school. The school was by the initiative of *Skanska Bygg* invited to take part in the problem solving throughout the construction process,

something that is not common under traditional procurement methods in Norway. But both *Skanska Bygg* and the *School* saw their inclusion as positive.

Skanska Eiendom in the project coalition as they have some of their people from the tender stage is now supporting the project construction team.

SG Finans are also part of the project coalition, though they are not part of the day-to-day decision making, they are the overall decision maker and the entity, which funds the project.

Undervisningsbygg has been involved with a couple of people throughout the construction process to share their experience with building and manage schools in Oslo. Though their role has been somewhat passive, their experience was received positively by the project coalition.

4.4.2 Overview

SG Finans and *Skanska Eiendom* won the bid contest. *Skanska Eiendom*, then split the project into two parts, the construction stage was set away to *Skanska Bygg,* and the facility management to *Coor*.

Throughout the process *Undervisningsbygg, Skanska Bygg* and to some extent *Coor* took part in the decision making process throughout the construction stage. Undervisningsbygg followed the project and shared their experience and knowledge, however *Coor* found this not to be working as well as it should. *Coor* found *Undervisningsbygg* to have an attitude of 'we know best, but it is your project so do what you want' (Interview 5), rather than actively suggest better solutions based on their extensive experience in building education facilities. Especially when they see that the solutions picked by *Coor* and *Skanska* were inferior. Though *Coor* seem to be the only party having a negative view of *Undervisningsbygg,* SG Finans would prefer *Undervisningsbygg* to take even less part in the process. The reason for this is that they believe this would increase the efficiency by *Skanska* in the building process (Interview 2, 3, 5).

Skanska Eiendom was not greatly involved in the construction stage as *Skanska Bygg* did the project management and execution. However *Skanska Eiendom*'s process manager, which was involved in the bidding stages, was now working with Skanska Bygg's project manager to push facility management friendly solutions to lower the life cost of the building down. Even though this job was mainly Coor's, Skanska believed that supporting this part of the project would benefit the overall success of the project (Interview 2 and 5).

Coor bought Skanska Facility Management, in the beginning of the tender process. This change of ownership led to *Coor* having a low focus on the project overall, especially in the design and construction stages. As a result *Skanska Bygg* and *Undervisningsbygg* have had to push *Coor* for input on critical design and material choices that would have an affect on the cost of FM. Even though the other parties have tried to push for FM friendly solutions, they agree that it would be a lot better if all parties collaborated on an earlier stage to implement such FM solutions. (Interview 3, 4, 5)

Skanska Bygg's project manager invited the Dean of the School for Persbråten to take part in the weekly construction meetings. This was something that was not planned, but highly appreciated by the *school.* This made it possible for the school to be able to affect smaller design choices such as colours, interior and smaller layout changes. Leading to an increased feeling of ownership by the *school.* (Interview 1 and 2)

SG Finans was also actively involved in the stage, however only to ensure that *Skanska* was delivering the value to the building expected. By regularly monitoring the construction process, *SG Finans* was able to control the risks associated with them as the owner of the buildings and sole investor, as well as keeping *Skanska Eiendom* to their contract (Interview 3).

Looking at the construction stage overall it is evident that the project management and the stakeholder management have been successful. *Skanska Bygg* has been the pillar in this management as the main contractor and project manager of the construction. Inviting the Dean of the school to take part in the weekly construction meetings as

well as supporting *Coor's* role to push quality solutions that will benefit the life cost of the building in the long run, are evidence of great stakeholder management.

Each party involved will have different perspectives depending on how the project outcome affects them. *Coor* carries a lot of the risk in relation to operating the school systems and cleaning, and are therefore more critical to issues affecting them. *Skanska* on the other hand holds the risk of the cost of building the facility and any maintenance costs related to the buildings (Interview 2 and 5). *Coor* being critical of *Undervisningsbygg's* lack of sharing their knowledge might have some truth, however it might also be a result of *Coor's* lack of commitment to the project, or lack of knowledge in FM services of schools (Interview 5).

4.4.3 Innovation

The PPP model used for these two projects have changed the decision making process. *SG Finans*, which is the legal owner of the two schools. Have under the PPP model a lot of the decision making power which under traditional contracting was kept by the client's representative (*Undervisningsbygg*). Though the client has had the possibility to make decisions throughout the process, the final say is now with the legal owner rather than the end-user and client.

As legal owner and sole investor, *SG Finans* is responsible for acquiring the rent from the client and to ensure the quality of the facility management service of the schools. *Skanska* is contractually responsible to *SG Finans* for the quality of the build and also the facility management.

Increased efficiency, as a result of less interruption by client

Another factor that have simplified the construction process for Skanska, is less people to report to / satisfy throughout the construction process. Under a traditional contract, where the client often control the project management they use several building managers to control that the building process is done to specifications. As a result of the PPP model, *Skanska* is now using their in-house people to check their own work. This is easier to manage and therefore leads to a more efficient building process (Interview 1).

To much involvement by the client

Though the client's representative *Undervisningsbygg* has not had as an active role in the project management as under a more traditional model. *SG Finans* still found their involvement more than necessary, and that and even more withdrawn role by the client would benefit the efficiency and flexibility of the building process even further (Interview 3).

Less client control over outcome

The school believes that they have lost some control over the outcome of the final facilities, as they haven't taken part of the design phase. They also found it hard to specify their requirements in the performance specification in such detail as to ensure their specific needs. However they are very satisfied with the final outcome in every way (Interview 1). From this you can conclude that the end-user might believe they know what the 'best way is', but the truth is that *Skanska* do as well. And that this criticism is founded more on personal feelings as a result of less ownership of the outcome, rather than the outcome itself.

4.5 Stage 4: Facility Management

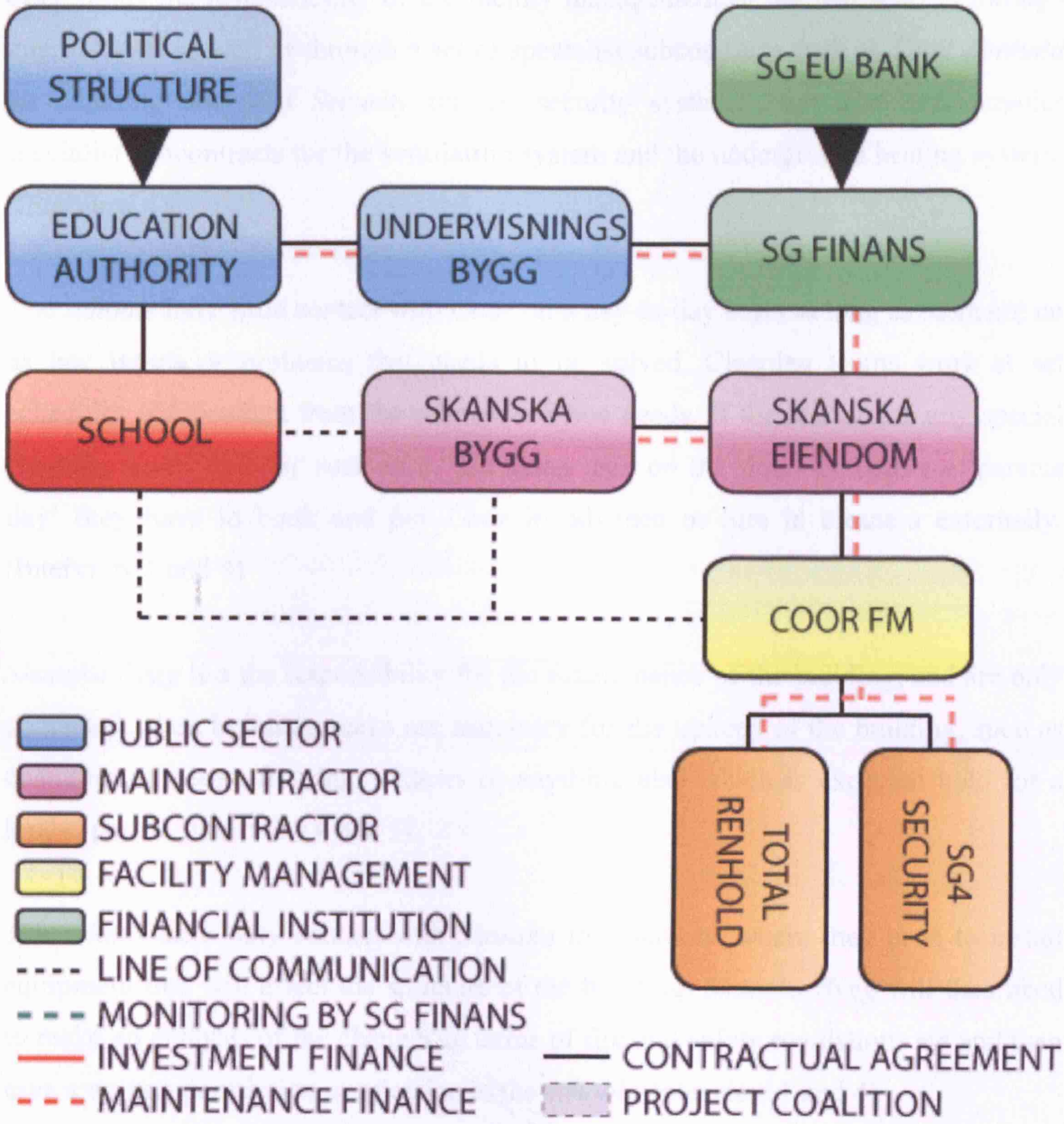

Figure 4.10 - Stage 4: Facility Management
(Source: Simonsen, 2008)

4.5.1 Diagram

The main interest with Figure 4.10 is the communication and maintenance finance lines. Though the communication goes direct between the *school, Skanka Bygg* and *Coor FM,* the maintenance finance do not. As the money goes from the client through *SG Finans,* before *Skanska* and *Coor,* the decision power follows the same line. The result is that the school have little or no say as on the FM service and maintenance, except ensuring that they provide the service as agreed in the contract.

4.5.2 Overview

Coor holds the responsibility of the facility management of the two schools through internal staff as well as through a set of specialist subcontracts such as *Total Renhold* for cleaning and *SG4 Security* for the security system. *Coor* also have smaller specialist subcontracts for the ventilation system and the underground heating system. (Interview 4)

The *schools* have little contact with *Coor* on a day-to-day basis as long as there are no as hoc issues or problems that needs to be solved. Cleaning teams work at set schedules independent from the schools' ad hoc needs. If the school has any special cleaning needs one day such as a "kid being sick on the floor' or before a 'parents day' they have to book and pay *Coor* in advance or hire in cleaners externally. (Interview 1 and 4)

Skanska Bygg has the responsibility for the maintenance of the building, and are only contacted when building works are necessary for the upkeep of the building, such as changing of doors, flooring, widows or anything else which is expected hold for a longer period (Interview 4 and 5).

The *school* have only contact with *Skanska* in situations where they need to install equipment that will affect the structure of the building. *Skanska Bygg* will then need to make an analysis of the changes in terms of fire and safety regulations etc and then give a written permission or rejection to the *school.* (Interview 1 and 4)

SG Finans have no contact with any part except *Skanska Eiendom* and *Undervisningsbygg.* The day-to-day activities are mainly financial and to ensure that Skanska are keeping to the contract and maintaining the building up the expected standard. (Interview 3,4 and 5)

4.5.3 Issues

Already after briefly a year of running the schools *Coor* has identified some misjudgement regarding the cost of the FM services. One example is that choosing sand in the playground of *Høybråten* primary school was the wrong choice (Interview 5). The problem is that even though with quality entry zones to stop dirt from the

outside being dragged in by the kids, sand gets into shoes and clothing and are impossible to keep from being dragged into the school building. The result is a much higher wear and tear on the building, leaving more resources necessary for cleaning and maintenance. *Skanska* takes the largest cost, as they are responsible for the maintenance of the building. The issue has left some debate between *Undervisningsbygg, Skanska* and *Coor,* as to who should take the cost of investing in changing the sand to a bouncy material. This issue is still to be resolved, but current indications suggest that all parties will take part in paying the cost. (Interview 2, 4 and 5)

Flexibility issues with cleaning teams and add hoc facility use

The end-user which prior to the PPP model, was in charge of their own facility management, feels that they have lost flexibility in the day-to-day use of the school (Interview 1). Before the PPP model, the Dean of the school had the possibility to re-organise the cleaners' tasks for a day if extra cleaning was necessary for an after school event (Interview 1 and 2). Another example of lack of flexibility is need to coordinate with Skanska in advance for renting out their facilities after school hours, as key cards needs to be made and lighting hours needs to be extended (Interview 1). As a result the end-user spend more time in managing the school facilities for ad-hoc situations than what it would do prior to the PPP model.

Security issues

Another factor that give evidence for less flexibility under the PPP model is the problems associated with the subcontractors of the FM contract, such as the security firm. The alarm system has been unstable and the alarm has started at random at all hours of the day. The school management feels that if the security firm were in contract with the school directly these issues would have been solved quicker. However as the security firm is hired through *Skanska*, there have been more arguments about whose fault it is that the system is malfunctioning, rather than fixing it (Interview 1). As a result the school have less flexibility in speeding up solutions to problems under the PPP model.

Flexibility issues regarding: Building modifications

Any changes to the school facility will under the PPP model will have to be signed off by *Skanska*, to ensure that it doesn't violate the "health and safety and fire regulations". As a result *Skanska* needs to be hired in by the school at a high cost to approve any changes as well as the company that will conduct the changes. Leading to lower flexibility for the school and increased costs (Interview 1 and 2).

5 CONCLUSION

5.1 Introduction

This research set out to identify the main views and experiences the main stakeholders involved with PPP school projects in Norway have. More specifically the research set out to identify the stakeholders perceived benefits of the PPP model and its areas of improvement.

After setting the objectives of this research, an extensive review of current literature was conducted on the PPP model. Areas reviewed included, the rationale behind the model, the benefits of the model and the project coalition. After conducting the literature review the research methodology was decided. A qualitative case study of the first and only school built on the PPP model in Norway was chosen. To collect primary data; five interviews were conducted with the project's main stakeholders. The interviews were designed as semi-structured with a mix of open-ended and closed-ended questions to open up for the interviewees to talk more freely. The interview design resulted in new interesting areas of knowledge, which were analysed thoroughly in the findings section.

5.2 Project coalition

The project coalition is evidently different than what Winch (2002) identified as the three types of project coalition. Similarities however are still strong with Winch's (2002) integrated project coalition. The findings show that the client has no direct involvement in the project, but uses a turnkey body, in this case *Undervisningsbygg*. *Undervisningsbygg* sells the two schools to the finance institution, *SG Finans* with a leaseback agreement that includes FM services for 25 years. Within the constraints of the contract, *SG Finans* is now holding all power over the decisions as the legal and financial owner over the schools. The role of the finance institution is the largest difference to Winch's (2002) project coalition models.

SG Finans on the other hand, awards the contract to *Skanska* to build and conduct the FM services of the schools for a fixed sum. *Skanska* selling its in-house FM services company further led to another level in the project coalition. Where the construction and FM services were divided between *Skanska Bygg* and *Coor* respectively.

The result is a project coalition structure that is different from that of Winch's project coalition models, but the function remains much the same as the integrated project coalition model suggested by Winch (2002).

5.3 Pre-tender

The findings made it clear that the funding given to the school to hire a 3rd party project manager is a new development in school construction in Norway. Under a traditional procurement method the client would use an architect to design the school, where the Dean of the school would be able to take part in the process. Giving the school the opportunity to work with an experienced 3rd party project manager to support them through the planning process opened up for much larger focus on the end-users objectives. The result is a satisfactory school administration, which gets a feel of ownership and pride with the new school. The findings also suggest that this affect has a positive impact of their attitude to the project overall, however more research will have to be conducted in this field to come to a stronger conclusion.

5.4 Tender stage

On initiative from the project manager at *Undervisningsbygg,* the Dean of the schools was invited to take part in the bidder selection process, a process that schools normally are not invited to. In addition it was not part of the agreement between the *Education Authority* and *Undervisningsbygg.* The initiative taken by *Undervisningsbygg's* project manager to include the school, show evidence of good stakeholder management skills.

5.5 Innovation

The findings show evidence of several innovation types, but mainly product and process innovation as categories by Page et al (1999). Pre-tender, the first stage of the project, show that process innovation has had the largest impact on the project. The pre-tender stage had under the PPP model, an increased focus on end-users. By the *Education Authority* providing the schools with dedicated funding for a 3rd party project manager as well as time for the school to have an internal process to collect and put together their objectives for the project. Leaving the school with increased ownership of the project outcome.

The Tender stage has seen a number of process innovations. The main change is how the decision power has changed to the finance institution and *Skanska*, rather than with the client or client's representative as under traditional procurement methods. This shift of decision power led to quicker decision processes and more flexibility in the design phase. Leaving *Skanska* with the ability to chose solutions more suitable for them, in both the short and long run of the project. These findings support the literature that by using the PPP model and having the client to increase focus on outcome measures of the project rather than how to achieve these outcomes measure (Grout, 2003). Would increase the contractors flexibility, resulting in lower construction and life-cycle costs of the building.

The increased design flexibility in the tender stage creates the foundation also for product innovation. *Skanska's* increased flexibility has let them chose new technologies, solutions and materials in the construction stage, which they believe, will benefit the cost of the project both in the short and long term. The findings reveal that quality materials and solutions were picked, further supporting that the PPP model give the finance institution and *Skanska* the incentive to deliver value for money throughout the project life-cycle.

5.6 Importance of including the FM firm early in the process

It is evident from the findings that the design decisions that created the problems for *Coor*, was a result of lack of involvement by *Coor* from an early stage in the project. Though the lack of *Coor's* involvement to the project overall was a result of their own organisational transition, rather than a problem with the PPP model. It still stands as strong evidence of the importance to include all the major parties involved in the project from an early stage.

5.7 Flexibility shift

The findings show that the PPP model and the shift of power from the client to the finance institution and Skanska, has shifted the flexibility in the project. *Skanska* and *SG Finans* have an increased flexibility in design choices, materials or anything that has to do with how they create the school. As long as it meets the project outcome measures agreed in the contract. The school administration as the end-user of the school has on the other hand lost a lot of their flexibility. Prior to the new school and under the traditional school system in Norway, the school was able to control the cleaners and the maintenance budget where they found it most applicable. Under the new PPP model and FM service provided with the contract, their flexibility to change the FM services to fit with ad-hoc events is now costly and difficult. Leaving the school with the need to use 3rd party personnel to take care of ad-hoc events.

The shift in flexibility highlights the importance for the Dean of the school to recognise the importance to consider the issues involved with the FM service already at the pre-tender stage. So that solutions to tackle such ad-hoc events are introduced before the tender stage.

The overall views of the PPP model used for these two projects are very positive. Any negative comments identified in the findings section have been about individual parts rather than the model as a whole. Proving that the model is seen to deliver more benefits than traditional procurement methods.

The researcher believes that the research has uncovered important new information that is valuable to stakeholders that will take part in similar projects in the future. However, it is also evident that the research has some limitations, especially of the long-term effects of the project. As the FM stage of the project has only seen the first year of operation of the total of 25-years. To conclude on the long-term affect of the project, the researcher believes that it would be beneficial to revisit the project in a few years, when the effects are clearer.

6 REFERENCES

Abdelhalim, B. (2007) *Cost Planning of PFI and PPP Building Projects.* Taylor & Francis, London

Afuah, A. N. and Bahram, N. (1995) The hypercube of innovation. Research Policy, Volume 24, pp. 51-76.

Anderson, F., Manseau, A., (1999) A systemic approach to generation / transmission / use of innovation in construction activities, *Third International Conference on Technology Policy and Innovation: Global Knowledge Partnership – Creating Value for the 21st Century.*

Atkin, B. and Leiringer, R. (2000) Defining the concept of Public Private Partnerships. Unpublished report, *Division of Construction Management and Economics,* Royal Institute of Technology, Stockholm.

Barrett, P., Sexton, M., Miozzo, M., Wharton, A. and Leho, E. (2001*) Innovation in Small Construction Firms.* Base report for EPSRC/DETR: IMI construction

Birnie, J. (1999) Private Finance Initative (PFI) – UK construction industry response, *Journal of Construction Procurement,* Volume 5, Issue 1, pp. 5-14

Black, S. (2001) PFI goes global. *Building Magazine,* pp. 26-27.

Blayse, A. and Manley, K. (2004) *The Rise of Roman Empire*. Penguin Books, Harmondsworth, England.

Boussabaine, A. (2007*) Cost planning of PFI and PPP Building Projects*, Taylor & Francis, New York.

Broadbent, J. and Laughlim, R. (2003) Public-private partnerships: and introduction, *Accounting, Auditing and Accountability Journal*, Volume 16, Issue 3, pp. 332-341

Currah, K.R. (2000) Activating the self-correcting mechanism of civil society: a critical analysis of TNC-NGO relations. *Public and Private Sector Partnerships: The Enabling Mix*. Sheffield Hallam University Press, Sheffield, UK. Proceedings of the 6th International Conference on Public and Private Sector Partnerships, Cork, May 24-27.

DTI (2003) *UK Innovation Survey,* Department of Trade and Industry, London.

Econ (1999): *Offentlig-privat samarbeid ved veiutbygging.* For Samferdselsdepartementet, Oslo, Norway

Edwards, P. and Shaoul, J. (2002) Partnerships: for better, for worse*?, Accounting, Auditing and Accountability Journal*, Volume 16, Issue 3, pp. 397-421.

Gann, D.M and Salter, A.J. (2000) Innovation in project-based, service enhanced firms: the construction of complex products and systems. *Research Policy*, Volume 29, pp. 955-972

Grimsey, D. and Lewis, M. K. (2004) The governance of contractual relationships in public-private partnerships. *The journal of Corporate Citizenship*, Volume 15, pp. 91-109

Grimsey, D. and Lewis, M. K. (2005) *The economics of public-private partnerships*, Northampton: Edwar Eldgar Publishing Limited

Grout, P. (1997) The economics of the private finance initiative, *Oxford Review of Economic Policy*, Volume 13, Issue 4, pp. 53-66

Grout, Paul A. (2003) Public and private sector discount rates in public-private partnerships. *The Economic Journal*, Volume 113, pp. 62-68

HM Treasury (2000) *Public-Private Partnerships: The Government's Approach,* London: The Stationary Office.

Hobday, M. (1998) Product complexity, innovation and industrial organisation. *Research Policy,* Volume 26, pp. 689-710.

Leiringer, R. (2003) Technological innovations in the context of public-private partnership projects, Working paper, Stockholm, Sweden

Lenard, D. (2001) *Promoting the development of an innovative culture through the strategic adoption of advanced manufacturing technology in construction.* Proceedings CIB World Building Congress, Wellington, New Zealand.

Marceau, J., Houghton, J., Toner, P., Manley, K, Gerasimou, E., Cook, N. (1999) *Mapping the Building and Construction Product System in Australia, Sydney,* Commonwealth Department of Industry, Science and Resources.

Mayston, D. J. (1999) The private-finance initiative in the National Health Service: An unhealthy development in New Public Management? *Financial Accountability & Management*, Volume 15, Issue 3 & 4, pp. 249-274

Montanheiro, L. (2000) The economic aspect within the enabling mix of public-private partnerships. *Public and Private Sector Partnerships: The Enabling Mix.* Sheffield Hallam University Press, Sheffield, UK. Proceedings of the 6th International Conference on Public and Private Sector Partnerships, Cork, May 24-27.

Muller, R. (2006) Borer 800 meter dyp brønn på leting etter jordvarme. *Aftenposten.*

Multimap (2008) Satellite photo [Available at: www.multimap.com]

NAO (2003) *PFI: Construction Performance,* London: The Stationary Office

OPS Portalen, (2008) Begrepet OPS [Available at: www.ops-portalen.net]

Owen, G. and Merina, A. (1997) The private finance initiative. *Engineering construction and Architectural Management*, Volume 4, Issue 3, pp. 163-177

Padmore, T., Schuetze, H. and Gibson, H. (1998) Modelling systems of innovation: An enterprise-centered view. *Research Policy,* Volume 26, pp. 605-624.

Page, M., Limeneh, M, Pearson, S. and Pryke, S. (1999) Understanding Innovation in Construction professional service firms: A study of quantity surveying firms. *RICS Research Foundation*, pp. 122-130

Parker, D. and Hartley, K. (2003) Transaction costs, relational contracting, and public-private partnerships: A case study of UK defence. *Journal of Purchasing and Supply Management*, Volume 9, Issue 3, pp. 97-108

Persbråten (2008) Historien til Persbråten [Available at: www.persbraten.vgs.no]

PricewaterhouseCoopers (2002) *Study into Rates of Return Bid on PFI Projects*, London

Polybius (1979) *The Rise of Roman.* Penguin Books, Harmondsworth, England.

Reichstein, T., Salter, A. and Gann, D. (2005) Last among equals: a comparison of innovation in construction, services and manufacturing in the UK. *Construction Management and Economics*, Volume 23, Issue 6, pp. 631-644.

Ribault, A. (2001) The lessons from the French experience in public and private partnerships. *Irish Banking Review*, pp. 49-60

RICS (2007) Public procurement New Rules, New Systems, *Special report*, Law update

Slaughter, E.S, (1998). Models for construction innovation, *Journal of Construction Engineering and Management,* Volume 124, Issue 3, pp. 226-231.

Smith, K. (1998) Science, technology and innovation indicators – a guide for policy makers, *IDEA paper series*, Volume 5, STEP group, Oslo.

Stake, R. (1995). *The art of case research.* Thousand Oaks, CA: Sage Publications.

The Smith Institute (2005) *Public sector Procurement and the Public Interest,* ed. D, Chevin, London: The Smith Institute.

Winch, G.M. (2002). *Managing Construction Projects*. Blackwell Science, Oxford.

Woessman, L. (2006) Public-Private Partnerships and Schooling Outcomes Across Countries. CESifo Working Paper No. 1662
[Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=889519]

Yin, R. (1993) *Applications of case study research.* Beverly Hills, CA: Sage Publishing.

Yin, R. (1994) *Case study research: Design and methods*, 2nd ed. Beverly Hills, CA: Sage Publishing.

Yin, R. K. (2003) *Case study research, design and methods,* 3rd ed. Newbury Park: Sage Publications